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ABSTRACT

This paper presents some of the preliminary findings of a longitudinal study for the determination of a set of measures which could be used to predict specific reading problems and general school achievement. The samples selected for study were from different socioeconomic groups. The paper deals specifically with the socioeconomic differences observed for the psychological and reading measures and reports some of the relationships found between the pre-school measures and the criterion-reading measures. The groups studied were kindergarten samples from four different urban schools. Tests administered included the: Stanford-Binet, Bender Gestalt, Hooper Visual-Organization, Draw-a-Person, kinesthetic perception, Copp-Clark Reading Series, Schonell Word Recognition, and McGahan's Early Detection Inventory. Implications of the test results are considered to indicate the socioeconomic variable would be considerably important in any study attempting isolation of predictors for reading problems. It is also held that socioeconomic groups would have to be analyzed separately to determine the best differentiating measures for that group. (RJ)

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A STUDY OF THE PSYCHOLOGICAL AND SOCIAL FACTORS RELATED TO PRESCHOOL PREDICTION OF READING RETARDATION

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A STUDY OF THE PSYCHOLOGICAL AND SOCIAL FACTORS RELATED TO PRESCHOOL PREDICTION OF READING RETARDATION

The problem of reading retardation has received increasing attention both from educators, psychiatrists, psychologists, and pediatricians, and from the parents whose children are affected. Both groups have experienced frustration because of the dearth of valid information presently available. The tendency of researchers and others in response to this problem has been to concentrate on one or other variables said to bear a causal relationship to reading skills and deal exclusively with children who apparently manifest a particular disability. The programs of Delecato (1959), Kephart (1960) and Frostig (1961) are examples of this type of particularized approach to diagnostics and remediation.

A longitudinal study instituted in 1964 had as its general aim the determination of a set of measures which could be used to predict specific reading problems and general school achievement. In this study an entire class of 142 kindergarten children at one suburban school were tested with a battery of psychometric instruments. In addition a prenatal interview form was used to determine birth order, birth weight, language(s) spoken in the home and other information which could be related to reading difficulties. These children were then tested for reading skills and general school progress at stipulated intervals over a three-year period. The preliminary results indicated that: (a) the number of significant negative deviations from the mean on the predictor tests is a better predictor of reading retardation than a low score on any one; (b) the younger bright child showed slower progress on the first of the basic tests given by the teachers but was performing at

the level of his older intellectual peers after the first year; (c) although 35 children in the sample would have been considered reading retardates after the first year, only eight had reading quotients less than 100 at the end of the third year; and (d) as pre-schoolers there was a trend for boys to be less capable in visual-motor and visual-perceptual skills but at no time in the first three years were they less capable than the girls in reading.

The present project represents an extension of the original study in two directions. First samples from different socioeconomic groups were selected for study, and second, the number of variables selected for study was increased so that a more complete description of the children's capabilities would be possible.

This paper will present some of the preliminary findings connected with the project. Specifically, it will deal with the socioeconomic differences observed for the psychological and reading measures and report some of the relationships found between the pre-school measures and the criterion reading measures. Other findings of the project will be reported in the papers following this one.

METHOD

Samples

The groups were selected for study such that a wide range of socio-economic backgrounds would be represented. The Blishen Index, which is based on a rating assigned to the father's occupation, was used for selecting the schools for study. In addition, one of the groups selected were participating in an open-area, non-graded school system. This group was selected so that their performance on the criterion measures could be contrasted with the

general school system in the middle-class area.

All of the children within a particular school were tested. This resulted in inequal numbers of children in the four groups.

The description of the groups is as follows:

1. A kindergarten sample of 64 children from an urban school were socioeconomic and cultural patterns may have inhibited the intellectual development of the children. For this school the mean Blishen Index for the father's occupation is 32.6. Of the total sample, 31 of the children participated in a Pre-Kindergarten Programme which provided the children with pre-kindergarten experiences. This sample is designated as School #1.

2. A kindergarten sample of 117 children from the previously sampled school (1964 sample) which is in a suburban middle-class area where the mean Blishen rating is 44.2 (School #2).

3. A kindergarten sample of 57 children participating in an open-area, non-graded school system. The emphasis in this system is on individual progress rather than progress relative to the group. The incidence of reading difficulties for this group will be compared with the results for School #2. This group is designated as School #3.

4. A kindergarten group of 54 children in an urban area where the socioeconomic status is very high. From a health and cultural viewpoint the children can be said to have had every advantage. The mean Blishen rating for this school was 66.9 (School #4).

Statistical analysis of the Blishen Index indicated no significant difference between schools 2 and 3. Significant differences were observed between school 1, schools 2 and 3, and school 4. This analysis suggests

that three significantly different socioeconomic groups have been selected for study.

The mean and range of school entrance ages in months for the four groups are:

SCHOOL	MEAN (in Months)	RANGE
1	75.34	70 - 81
2	74.19	68 - 81
3	74.18	68 - 80
4	73.97	66 - 81

Measures

1. The Stanford-Binet Intelligence Test (1960 Revised Edition).

2. The Bender Visual-Motor Gestalt Test: (L. Bender.)

This paper and pencil test involves the perception of spatial relations and the reproduction of forms. It has been used as an informal test for possible brain damage, as an indicator of emotional disturbance, and for developmental assessment of visual-motor coordination.

3. Vocabulary:

This is the vocabulary test of the Stanford-Binet.

4. The Hooper Visual-Organization Test: (H. E. Hooper.)

This was devised as an objectively scored test for the diagnosis of organic brain pathology and for the differentiation of such pathology from functional and motivational disorders. Since it is found to be sensitive to physiological changes in cortical structures, it was assumed that developmental trends might appear when it was administered to children. The activity involved the formation of a Gestalt from scattered pieces of a simple object. No motor

activity was involved except the naming of the object. Thus it could be regarded as a pure test of visual perception.

5. The Closure Test: (This is an unpublished test constructed by Anne Bell of the Child Development Clinic in Winnipeg.)

It consists of 10 cards which are in part intended to measure the child's ability to isolate a well-known figure from a distracting background. The closure factor was also involved in that the child had to form the Gestalt from an incomplete figure. Again, only the naming of the object was required rather than any reproduction.

6. An Auditory Test:

This test consisted of subtests measuring discrete sound discrimination, sentence and digit memory, and sound blending. An original tape recording was devised in order to present the materials in a standardized manner.

7. D.A.P.:

The seventh was the score for the Draw-a-Person test scored by the Harris Goodenough method (1963).

8. Kinesthesis:

This measure involves tactile and kinesthetic perception. A number of articles were placed in the child's hands which were behind his back. He was asked to name each by touch and kinesthetic exploration. Pictures of the shapes were before the child at all times. If he could not name the shape, he could point to it.

9. Total Reading Score:

Eighty words selected from the Copp-Clark Reading Series. The score was simply the total number of words that the child could read or identify.

10. Schonell Word Recognition: (Schonell.)

An extensively used graded word list from which is derived a reading age and grade standing. The vocabulary of this test is not necessarily drawn from the readers used by the child so that it provides a measure of the extent to which a child is able to make use of his learned word study skills in recognizing words not specifically taught. He is not aided by pictures or context.

11. Early Detection Inventory: (McGahan & McGahan, 1967.)

Only two sections of this test were used to determine this score. The School Readiness tasks and the Motor Performance tasks from the inventory were used to derive the child's total score.

Procedure

All of the children in the samples were tested prior to school entry in September 1969. Each of the tests was administered to children from the different schools at approximately the same time. With tests such as the Stanford-Binet, simultaneous testing in the different samples was not completely possible, but since the scores were determined in terms of their age at time of testing, this was not considered to be a critical factor.

All of the children in the different schools were also given two reading tests in January, 1970. These tests--as I described earlier--consisted of identification of words taken from the Copp-Clark reading series and from the Schonell test.

RESULTS

The data from the pre-school testing and the reading tests were treated

in two ways. First, the mean scores for each of the samples on each of the tests were compared, and secondly, the test scores for the entire group of 292 children were intercorrelated and factor analyzed. The first analysis was undertaken to determine the magnitude of socioeconomic differences for the predictor and criterion measures while the correlational analysis was intended to determine the degree of relationship existing between the predictors and mid-year reading scores. The factor analysis was applied in an effort to determine the degree of dependency or overlap in the test battery.

Table I in the hand-out outlines the mean scores for each of the samples on each of the tests in the battery. Analysis of Variance applied to each of the measures revealed a significant difference between schools for all of the variables except the Kinesthesis tests. Even for this test, however, there is a significant difference between School I, the lowest socioeconomic sample, and the other schools.

I should point out what is perhaps obvious from the figures in the first row of the table--that is, the Analysis of Variance for the Blishen Index was also significant indicating that three significantly different socioeconomic samples had been selected for study. The differences between schools 2 and 3 were not significant.

The immediate implication of the results outlined in Table I is that the socioeconomic variable would be of considerable importance in any study attempting to isolate predictors for reading problems. It would appear that socioeconomic groups would have to be analyzed separately to determine the best differentiating measures for that group. Perhaps the analysis which involves determining the number of abnormalities rather than magnitude on a

single variable will prove to be the most effective. This approach was reported by Bell in 1966.

One other implication of these results is that--on the average--children from a low socioeconomic background reach school entry age with lower intellectual, perceptual and perceptual-motor abilities as compared with their peers of middle and high socioeconomic status. Further research on this group could focus on determining the strengths of these "disadvantaged" children and formulating appropriate programmes for them.

A rather surprising finding--in some respects--was the significant difference observed between schools 2 and 3 on the reading measures. The open-area children identified significantly less words when compared to their peers from the more conventional school system. This finding might be an artifact derived from the particular school tested, or, it might indicate that the open-area system is not appropriate during the early school years when reading skills are being acquired. The two schools will be compared on the final reading measure to be administered in June of this year and if differences are still evident, the study will be repeated using another open-area group.

The results of the intercorrelations of the various tests administered prior to school entry and the reading tests are outlined in Table II. Consistent with the findings reported by Bell for a single school, we find that the Stanford-Binet I.Q. correlates highest with the reading scores. The I.Q. measure correlated .544 with the total reading score and .532 with the Schonell. Of considerable interest too is the fairly high correlations observed between the Early Detection Inventory and the reading scores.

These correlations are .520 with total reading and .514 with the Schonell scores. This finding is of interest because the sections of the Early Detection Inventory used to determine the child's score are much easier to administer than the Stanford-Binet. Further analysis will be aimed at determining whether this relationship holds for the individual samples.

The results of the factor analysis are presented in Table III. The factor analysis was performed not so much for the interpretation of the factors as to determine whether the Stanford-Binet and the Early Detection Inventory loaded the same factors. Inspection of Table III indicates that the distribution of loadings for Variables 1 and 2 are quite similar--suggesting that these variables are related to the reading measures in terms of the same components.

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TABLE I

MEAN TEST PERFORMANCE ON THE COMPLETED MEASURES FOR THE FOUR SCHOOLS SELECTED FOR STUDY

	Measures	School 1	2	3	4
	Blishen Index	32.56	44.21	45.22	66.96
1	Stanford-Binet	91.79	111.92	112.28	120.54
2	Bender Gestalt	23.67	25.49	25.19	26.06
3	Vocabulary	4.48	7.36	7.03	8.03
4	Hooper	15.10	18.48	17.50	18.00
5	Closure	6.06	7.05	6.82	7.40
6	Auditory	16.43	19.97	20.07	20.56
7	D.A.M.	86.16	91.45	94.76	97.32
8	Kinesthesis	16.24	17.62	18.04	17.72
9	Total Reading	6.27	21.94	12.16	29.48
10	Schonell	1.69	5.02	3.00	7.43
11	Early Detection	16.84	19.81	20.89	21.74

TABLE II

INTER-MEASURE CORRELATIONS

	S.B. I.Q.	Bend. Gest.	Vocab.	Hooper	Closure	Aud.	D-a-P	Kines.	Total Read.	Schon.	Early Det.
	1	2	3	4	5	6	7	8	9	10	11
1	1.000	.411	.734	.485	.426	.565	.371	.368	.544	.532	.568
2		1.000	.247	.375	.339	.219	.396	.350	.373	.368	.320
3			1.000	.466	.420	.518	.247	.286	.447	.439	.442
4				1.000	.534	.381	.197	.348	.333	.305	.376
5					1.000	.308	.187	.323	.364	.342	.456
6						1.000	.280	.292	.461	.443	.501
7							1.000	.261	.271	.249	.398
8								1.000	.217	.185	.396
9									1.000	.940	.520
10										1.000	.514
11											1.000

TABLE III

VARIMAX FACTORS

	Factors		
Measures	I	II	III
1	.499	-.630	.247
2	.200	-.204	.734
3	.417	-.705	.010
4	.091	-.769	.183
5	.145	-.696	.187
6	.482	-.529	.085
7	.210	-.046	.778
8	-.072	-.501	.534
9	.904	-.189	.190
10	.918	-.161	.171
11	.473	-.453	.374